

China's Upper Mekong Dams Endanger Millions Downstream

The Mekong River is the heart and soul of mainland Southeast Asia. Over 60 million people depend on the Mekong and its tributaries for food, water, transport and many other aspects of their daily lives. The river supports one of the world's most diverse fisheries, second only to Brazil's Amazon River.

This complex ecosystem, and the livelihoods of millions who depend on it, is threatened by China's plans to build eight large dams on the upper reaches of the Mekong in Yunnan Province.

The scheme will drastically change the river's natural flood-drought cycle and block the transport of sediment. These environmental changes will affect the livelihoods of millions of people living downstream in Burma, Thailand, Laos, Cambodia and Vietnam. Despite these serious potential impacts, construction of the Upper Mekong dams has proceeded without consultation with China's downstream neighbors, and without any real assessment of the likely impacts to the river and its people.

A Grand Cascade

China plans to build eight dams on the Upper Mekong to supply power to southwest China and Thailand. The first dam in the scheme, the Manwan Dam, was completed in 1996 without prior consultation with China's downstream neighbors. No Environmental Impact Assessment of downstream impacts was carried out. When the reservoir was filled in the 1992-1993 dry season, Thai authorities complained that the dam caused unusually low water levels downstream in the province of Chiang Rai.

Construction of the second dam, Dachaoshan, started in 1996 and is scheduled for completion by 2003. The Asian Development Bank, which claims it would not fund a dam on the main-stream of the Mekong, funded the transmission lines for the project.

A third dam, Xiaowan, began construction in December 2001 and is expected to be completed



Mekong River near Baoshan, China

in 2012. At 292 meters in height, Xiaowan would be one of the highest dams in the world. Impoundment of water during the wet season for Xiaowan would increase dry season flows by up to 70% as far as 1,000 km downstream in Vientiane, Laos. The dam would block 35 percent of the silt that nourishes the fertile floodplains downstream.

The remaining five projects are currently in the planning stages. Jinghong is expected to begin construction in the next few years. The governments of China and Thailand have formally signed an agreement to jointly develop the 1,500 MW Jinghong Dam despite

Thailand's current massive oversupply of electricity. Thailand is also negotiating with Yunnan Province over importing some of the power produced by Nuozhadu Dam.

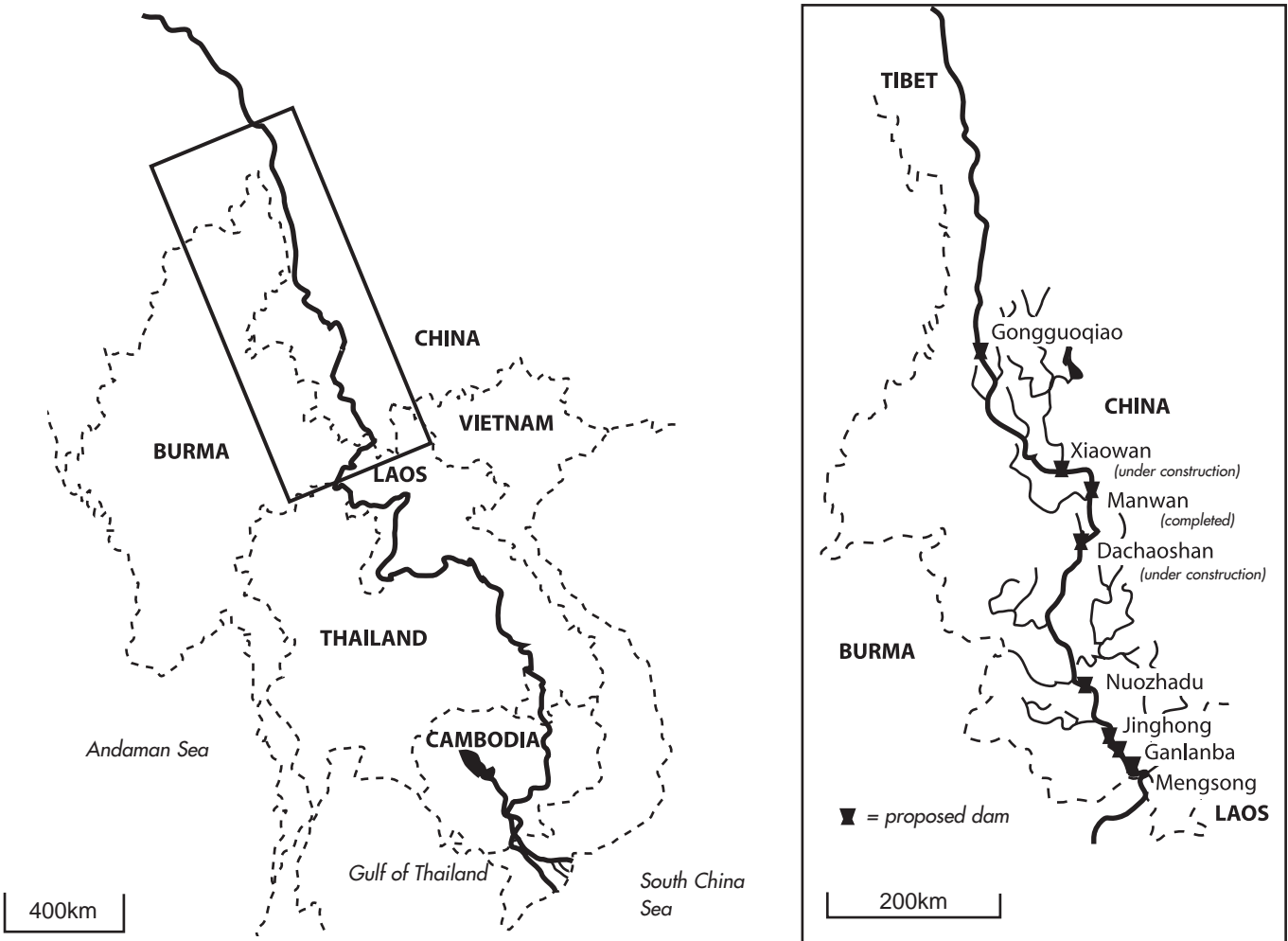
Impacts to Downstream Areas

The Upper Mekong dams threaten to disrupt the Mekong's complex riverine ecosystem upon which millions of people depend for fish and agriculture. About 90% of the population in the Mekong basin is engaged in agriculture and depends on wild caught fish from the Mekong and its tributaries for 80% of their protein needs. The Mekong River Commission (MRC) estimates that the total value of fish caught per year in the lower Mekong basin is more than \$1 billion.

The health and integrity of the Mekong's ecosystem depends largely on two main factors: the annual and predictable flood-drought cycle of the

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Mekong River basin. Box highlights section of river where China plans to construct eight dams

river and the enriching sediment washed down from the upper catchment. The mainstream dams on the Upper Mekong in China will drastically affect each of these factors.

Dams on the Upper Mekong may double the average water flow in the lower Mekong during the dry season, changing the natural cycle of the river. While only 15-20% of the total annual flow in the Mekong that reaches Vietnam is generated in China, the Upper Mekong contribution forms a large part of the river's dry season flow along in Laos and Thailand. In Cambodia, it makes up almost 45% of the average flow in April. The reservoirs in Yunnan would impound water in the wet season and release water in the dry season, causing much higher water levels during the dry season.

In addition, it is estimated that half of the Mekong's annual sediment load originates in the Chinese part of the watershed. The dams will impound this sediment, threatening the viability of the dams themselves – which are likely to fill with sediment and become useless – and resulting in much lower sediment loads in the middle and lower Mekong.

These changes are likely to have the following impacts on the Mekong basin:

Destruction of fish and fisheries

Feeding and spawning conditions for fish that have adapted to live in the sediment rich Mekong will be seriously disrupted, which may lead to a decline in biodiversity and productivity. Spawning sites may be drastically reduced in the dry season, as rapids fail to become exposed, and in the rainy season lower water levels in the flooded forests of southern Laos and Cambodia will affect important fish feeding, spawning and nursery grounds. This will result in a major decline in fisheries in the Mekong basin, including possible extinction of some species.

Impacts on agriculture

About 80% of rice production in the lower Mekong basin depends on water, silt and nutrients provided by the seasonal flooding of the Mekong. Greater regulation of the flood cycle means that there will be less frequent floods, which will decrease sediment and nutrient deposition and hence reduce soil fertility. Without a massive program of artificial fertilizer use, long-term agricultural yields will decline.

Higher flows during the dry season will flood riverbank vegetable gardens, common along the entire length of the Mekong. Reduced sediment and nutrient deposition in the

Status of Lancang-Mekong Dam Cascade Scheme

| SITE | DAM HEIGHT (m) | INSTALLED CAPACITY (MW) | RESETTLEMENT (persons) | CURRENT STATUS | COMPLETION (year) |
|------------|----------------|-------------------------|------------------------|--------------------|-------------------|
| Manwan | 126 | 1,500 | 3,513 | Completed | 1996 |
| Dachaoshan | 110 | 1,350 | 6,054 | Under construction | 2003 |
| Xiaowan | 300 | 4,200 | 32,737 | Under construction | 2012 |
| Jinghong | 118 | 1,500 | 2,264 | Feasibility study | 2010 |
| Nuozhadu | 254 | 5,000 | 23,826 | Feasibility study | 2017 |
| Gonguoqiao | 130 | 750 | ? | ? | ? |
| Ganlanba | ? | 150 | ? | ? | ? |
| Mengsong | ? | 600 | ? | ? | ? |

(Source: Plinston & Daming, 2000)

rainy season will result in lower yields. Again, this could lead to the application of artificial fertilizers, thereby increasing costs of production and lowering the economic viability of this livelihood strategy.

Widespread erosion

Water released from the lowest dam in the scheme will have less sediment than before and will therefore scour and erode the bed of the river downstream. This erosion could alter the Mekong's course and width, weaken supports for buildings, piers and bridges, and cause financial loss to the downstream areas.

Who's Paying?

The China Development Bank (CDB) a Chinese government bank, is expected to provide the majority of funding

for the Upper Mekong dams. The CDB raises funds internationally by selling bonds. In the past, US investment banks, including Morgan Stanley, and Credit Suisse First Boston, have helped facilitate sales by underwriting \$830 million in CDB bonds in 1997 and 1999. A third dam, Xiaowan, began construction in December 2001 and is expected to be completed in 2012. Impoundment of water during the wet season for Xiaowan would increase dry season flows by up to 70% as far as 1,000 km downstream in Vientiane, Laos. The dam would block 35 percent of the silt that nourishes the fertile floodplains downstream.

For more information:

Visit www.irn.org/programs/lancang.



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